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Shuto et al.

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(54) **RECORDING APPARATUS**

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See application file for complete search history.

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(56) **References Cited**

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U.S. PATENT DOCUMENTS

5,184,902	A	2/1993	Harada et al.	
5,245,362	A	9/1993	Iwata et al.	
5,842,795	A	12/1998	Narita et al.	
2002/0021343	A1 *	2/2002	Uchida	B41J 29/13 347/108
2004/0067089	A1 *	4/2004	Tanaami	B41J 29/02 400/693

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FOREIGN PATENT DOCUMENTS

EP	2682271	1/2014	
JP	2005-022273	* 1/2005	B41J 2/01
JP	2005-022273	A 1/2005	
JP	2006-347059	A 12/2006	
JP	2009-165268	A 7/2009	

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OTHER PUBLICATIONS

European Search Report for Application No. 15171841.8 dated Oct. 23, 2015.

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* cited by examiner

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(57) **ABSTRACT**

A printer includes a carriage which includes an ink jet recording head and is movable in a first direction and a second direction that is an opposite direction to the first direction, a gear group which transmits power of a motor to a sheet transporter, a transporter drive motor which transmits power to the gear group, and a carriage drive motor which drives the carriage. At least a portion of the carriage drive motor and at least a portion of the gear group are at the same position as each other in a movement direction (x direction) of the carriage.

(52) **U.S. Cl.**

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B41J 2/01 (2013.01); **B41J 19/202** (2013.01);
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